

GSHWG ARAC Fast Track Report – FAR 25.683 Operations tests

1 - What is underlying safety issue addressed by the FAR/JAR?

The purpose of the FAR is to substantiate that operation of the airplane control system is not adversely affected(jamming, friction, deflection) by structural loading up to maximum load expected in the control system in normal operation.

The JAR incorporates the FAR, and adds a requirement to substantiate that the operation of the airplane control system is not adversely affected(jamming, friction, disconnection, damage) by the presence of deflections of the aeroplane structure due to the separate application of pitch, roll and yaw limit manoeuvre loads. The JAR also adds a requirement to substantiate that the vibrations in the airplane in normal operation do not adversely affect (interference or contact) the control systems.

2 - What are the current FAR and JAR standards?

Current FAR text:

FAR 25.683 Operation tests.

It must be shown by operation tests that when portions of the control system subject to pilot effort loads are loaded to 80 percent of the limit load specified for the system and the powered portions of the control system are loaded to the maximum load expected in normal operation, the system is free from--

- (a) Jamming;
- (b) Excessive friction; and
- (c) Excessive deflection.

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Current JAR text:

JAR 25.683 Operation tests

(a) It must be shown by operation tests that when portions of the control system subject to pilot effort loads are loaded to 80% of the limit load specified for the system and the powered portions of the control system are loaded to the maximum load expected in normal operation, the system is free from -

- (1)Jamming;
- (2)Excessive friction; and
- (3)Excessive deflection.

(b) It must be shown by analysis and, where necessary, by tests that in the presence of deflections of the aeroplane structure due to the separate application of pitch, roll and yaw limit manoeuvre loads, the control system, when loaded to obtain these limit loads and operated within its operational range of deflections can be exercised about all control axes and remain free from -

- (1) Jamming;
- (2) Excessive friction;
- (3) Disconnection, and
- (4) Any form of permanent damage.

(c) It must be shown that under vibration loads in the normal flight and ground operating conditions, no hazard can result from interference or contact with adjacent elements.

3 - What are the differences in the standards and what do these differences result in?:

The differences in the standards are discussed in item 1. The differences in the standards result in additional analyses and tests, relative to the FAR, to demonstrate compliance to the JAR

4 - What, if any, are the differences in the means of compliance?

JAA have additional requirements that may require additional tests at limit load.

5 - What is the proposed action?

Since the JAR envelopes the FAR, adopt the JAR as written.

6 - What should the harmonized standard be?

Adopt the JAR.

7 - How does this proposed standard address the underlying safety issue (identified under #1)?

The proposed change to the FAR will add specific criteria associated with control movement under structural deflection and may require additional testing for substantiation. In addition there will be a specific requirement to show that no hazard can result from interference or contact with adjacent elements under vibration.

8 - Relative to the current FAR, does the proposed standard increase, decrease, or maintain the same level of safety? Explain.

There will be some increase in the rigor with which the effects of structural load and vibration on the airplane control system are considered in the regulation,

however the new regulation retains approximately the same level of safety as the existing regulation.

9 - Relative to current industry practice, does the proposed standard increase, decrease, or maintain the same level of safety? Explain.

Maintains the same level of safety.

10 - What other options have been considered and why were they not selected?:

None

11 - Who would be affected by the proposed change?

US airplane manufacturers who do not certificate to the JAR standards would be affected by the change. These manufacturers may have to perform the additional specific tests and analysis necessary to substantiate that the requirement adopted from the JAR is complied with

12 - To ensure harmonization, what current advisory material (e.g., ACJ, AMJ, AC, policy letters) needs to be included in the rule text or preamble?

None.

13 - Is existing FAA advisory material adequate? If not, what advisory material should be adopted?

Currently there is no advisory material in either the FAR or JAR covering this regulation. Difference in interpretation of the method of compliance could exist and therefore advisory material needs to be written so that the same level of safety is achieved in certification both in the US and abroad.

14 - How does the proposed standard compare to the current ICAO standard?

ICAO does not have the specific JAR requirement.

15 - Does the proposed standard affect other HWG's?

Coordinate with the Flight Control Harmonization Working Group.

16 - What is the cost impact of complying with the proposed standard?

Not substantial.

17 - Does the HWG want to review the draft NPRM at "Phase 4" prior to publication in the Federal Register?

YES

18 – In light of the information provided in this report, does the HWG consider that the “Fast Track” process is appropriate for this rulemaking project, or is the project too complex or controversial for the Fast Track Process. Explain.

The GSHWG believes that the regulation should be enveloped under the fast track process. There is however a need to provide substantive advisory information to ensure uniform application. The GSHWG requests that it be tasked to prepare the necessary advisory material.

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